

INTERACTIVE TELEVISION PROGRAM  
GUIDE WITH REMOTE ACCESS

30  
40  
50  
60  
70  
80  
90  
100  
110  
120  
130  
140  
150  
160  
170  
180  
190  
200  
210  
220  
230  
240  
250  
260  
270  
280  
290  
300  
310  
320  
330  
340  
350  
360  
370  
380  
390  
400  
410  
420  
430  
440  
450  
460  
470  
480  
490  
500  
510  
520  
530  
540  
550  
560  
570  
580  
590  
600  
610  
620  
630  
640  
650  
660  
670  
680  
690  
700  
710  
720  
730  
740  
750  
760  
770  
780  
790  
800  
810  
820  
830  
840  
850  
860  
870  
880  
890  
900  
910  
920  
930  
940  
950  
960  
970  
980  
990  
1000  
1010  
1020  
1030  
1040  
1050  
1060  
1070  
1080  
1090  
1100  
1110  
1120  
1130  
1140  
1150  
1160  
1170  
1180  
1190  
1200  
1210  
1220  
1230  
1240  
1250  
1260  
1270  
1280  
1290  
1300  
1310  
1320  
1330  
1340  
1350  
1360  
1370  
1380  
1390  
1400  
1410  
1420  
1430  
1440  
1450  
1460  
1470  
1480  
1490  
1500  
1510  
1520  
1530  
1540  
1550  
1560  
1570  
1580  
1590  
1600  
1610  
1620  
1630  
1640  
1650  
1660  
1670  
1680  
1690  
1700  
1710  
1720  
1730  
1740  
1750  
1760  
1770  
1780  
1790  
1800  
1810  
1820  
1830  
1840  
1850  
1860  
1870  
1880  
1890  
1900  
1910  
1920  
1930  
1940  
1950  
1960  
1970  
1980  
1990  
2000  
2010  
2020  
2030  
2040  
2050  
2060  
2070  
2080  
2090  
2100  
2110  
2120  
2130  
2140  
2150  
2160  
2170  
2180  
2190  
2200  
2210  
2220  
2230  
2240  
2250  
2260  
2270  
2280  
2290  
2300  
2310  
2320  
2330  
2340  
2350  
2360  
2370  
2380  
2390  
2400  
2410  
2420  
2430  
2440  
2450  
2460  
2470  
2480  
2490  
2500  
2510  
2520  
2530  
2540  
2550  
2560  
2570  
2580  
2590  
2600  
2610  
2620  
2630  
2640  
2650  
2660  
2670  
2680  
2690  
2700  
2710  
2720  
2730  
2740  
2750  
2760  
2770  
2780  
2790  
2800  
2810  
2820  
2830  
2840  
2850  
2860  
2870  
2880  
2890  
2900  
2910  
2920  
2930  
2940  
2950  
2960  
2970  
2980  
2990  
3000  
3010  
3020  
3030  
3040  
3050  
3060  
3070  
3080  
3090  
3100  
3110  
3120  
3130  
3140  
3150  
3160  
3170  
3180  
3190  
3200  
3210  
3220  
3230  
3240  
3250  
3260  
3270  
3280  
3290  
3300  
3310  
3320  
3330  
3340  
3350  
3360  
3370  
3380  
3390  
3400  
3410  
3420  
3430  
3440  
3450  
3460  
3470  
3480  
3490  
3500  
3510  
3520  
3530  
3540  
3550  
3560  
3570  
3580  
3590  
3600  
3610  
3620  
3630  
3640  
3650  
3660  
3670  
3680  
3690  
3700  
3710  
3720  
3730  
3740  
3750  
3760  
3770  
3780  
3790  
3800  
3810  
3820  
3830  
3840  
3850  
3860  
3870  
3880  
3890  
3900  
3910  
3920  
3930  
3940  
3950  
3960  
3970  
3980  
3990  
4000  
4010  
4020  
4030  
4040  
4050  
4060  
4070  
4080  
4090  
4100  
4110  
4120  
4130  
4140  
4150  
4160  
4170  
4180  
4190  
4200  
4210  
4220  
4230  
4240  
4250  
4260  
4270  
4280  
4290  
4300  
4310  
4320  
4330  
4340  
4350  
4360  
4370  
4380  
4390  
4400  
4410  
4420  
4430  
4440  
4450  
4460  
4470  
4480  
4490  
4500  
4510  
4520  
4530  
4540  
4550  
4560  
4570  
4580  
4590  
4600  
4610  
4620  
4630  
4640  
4650  
4660  
4670  
4680  
4690  
4700  
4710  
4720  
4730  
4740  
4750  
4760  
4770  
4780  
4790  
4800  
4810  
4820  
4830  
4840  
4850  
4860  
4870  
4880  
4890  
4900  
4910  
4920  
4930  
4940  
4950  
4960  
4970  
4980  
4990  
5000  
5010  
5020  
5030  
5040  
5050  
5060  
5070  
5080  
5090  
5100  
5110  
5120  
5130  
5140  
5150  
5160  
5170  
5180  
5190  
5200  
5210  
5220  
5230  
5240  
5250  
5260  
5270  
5280  
5290  
5300  
5310  
5320  
5330  
5340  
5350  
5360  
5370  
5380  
5390  
5400  
5410  
5420  
5430  
5440  
5450  
5460  
5470  
5480  
5490  
5500  
5510  
5520  
5530  
5540  
5550  
5560  
5570  
5580  
5590  
5600  
5610  
5620  
5630  
5640  
5650  
5660  
5670  
5680  
5690  
5700  
5710  
5720  
5730  
5740  
5750  
5760  
5770  
5780  
5790  
5800  
5810  
5820  
5830  
5840  
5850  
5860  
5870  
5880  
5890  
5900  
5910  
5920  
5930  
5940  
5950  
5960  
5970  
5980  
5990  
6000  
6010  
6020  
6030  
6040  
6050  
6060  
6070  
6080  
6090  
6100  
6110  
6120  
6130  
6140  
6150  
6160  
6170  
6180  
6190  
6200  
6210  
6220  
6230  
6240  
6250  
6260  
6270  
6280  
6290  
6300  
6310  
6320  
6330  
6340  
6350  
6360  
6370  
6380  
6390  
6400  
6410  
6420  
6430  
6440  
6450  
6460  
6470  
6480  
6490  
6500  
6510  
6520  
6530  
6540  
6550  
6560  
6570  
6580  
6590  
6600  
6610  
6620  
6630  
6640  
6650  
6660  
6670  
6680  
6690  
6700  
6710  
6720  
6730  
6740  
6750  
6760  
6770  
6780  
6790  
6800  
6810  
6820  
6830  
6840  
6850  
6860  
6870  
6880  
6890  
6900  
6910  
6920  
6930  
6940  
6950  
6960  
6970  
6980  
6990  
7000  
7010  
7020  
7030  
7040  
7050  
7060  
7070  
7080  
7090  
7100  
7110  
7120  
7130  
7140  
7150  
7160  
7170  
7180  
7190  
7200  
7210  
7220  
7230  
7240  
7250  
7260  
7270  
7280  
7290  
7300  
7310  
7320  
7330  
7340  
7350  
7360  
7370  
7380  
7390  
7400  
7410  
7420  
7430  
7440  
7450  
7460  
7470  
7480  
7490  
7500  
7510  
7520  
7530  
7540  
7550  
7560  
7570  
7580  
7590  
7600  
7610  
7620  
7630  
7640  
7650  
7660  
7670  
7680  
7690  
7700  
7710  
7720  
7730  
7740  
7750  
7760  
7770  
7780  
7790  
7800  
7810  
7820  
7830  
7840  
7850  
7860  
7870  
7880  
7890  
7900  
7910  
7920  
7930  
7940  
7950  
7960  
7970  
7980  
7990  
8000  
8010  
8020  
8030  
8040  
8050  
8060  
8070  
8080  
8090  
8100  
8110  
8120  
8130  
8140  
8150  
8160  
8170  
8180  
8190  
8200  
8210  
8220  
8230  
8240  
8250  
8260  
8270  
8280  
8290  
8300  
8310  
8320  
8330  
8340  
8350  
8360  
8370  
8380  
8390  
8400  
8410  
8420  
8430  
8440  
8450  
8460  
8470  
8480  
8490  
8500  
8510  
8520  
8530  
8540  
8550  
8560  
8570  
8580  
8590  
8600  
8610  
8620  
8630  
8640  
8650  
8660  
8670  
8680  
8690  
8700  
8710  
8720  
8730  
8740  
8750  
8760  
8770  
8780  
8790  
8800  
8810  
8820  
8830  
8840  
8850  
8860  
8870  
8880  
8890  
8900  
8910  
8920  
8930  
8940  
8950  
8960  
8970  
8980  
8990  
9000  
9010  
9020  
9030  
9040  
9050  
9060  
9070  
9080  
9090  
9100  
9110  
9120  
9130  
9140  
9150  
9160  
9170  
9180  
9190  
9200  
9210  
9220  
9230  
9240  
9250  
9260  
9270  
9280  
9290  
9300  
9310  
9320  
9330  
9340  
9350  
9360  
9370  
9380  
9390  
9400  
9410  
9420  
9430  
9440  
9450  
9460  
9470  
9480  
9490  
9500  
9510  
9520  
9530  
9540  
9550  
9560  
9570  
9580  
9590  
9600  
9610  
9620  
9630  
9640  
9650  
9660  
9670  
9680  
9690  
9700  
9710  
9720  
9730  
9740  
9750  
9760  
9770  
9780  
9790  
9800  
9810  
9820  
9830  
9840  
9850  
9860  
9870  
9880  
9890  
9900  
9910  
9920  
9930  
9940  
9950  
9960  
9970  
9980  
9990  
10000

This application claims the benefit of United States provisional patent application Serial No. 60/093,292, filed July 17, 1998, and United States provisional patent application Serial No. 60/097,527, filed August 21, 1998.

Background of the Invention

This invention relates to interactive television program guide video systems, and more particularly, to interactive television program guide systems that provide remote access to program guide functionality.

Cable, satellite, and broadcast television systems provide viewers with a large number of television channels. Users have traditionally consulted printed television program schedules to determine the programs being broadcast at a particular time. More recently, interactive electronic television program guides have been developed that allow television program information to be displayed on a user's television.

Interactive television program guides allow the user to navigate through television program

listings using a remote control. In a typical program guide, various groups of television program listings are displayed in predefined or user-defined categories. Listings are typically displayed in a grid or table.

5           Interactive television program guides are typically implemented on set-top boxes located in the homes of users. A typical set-top box is connected to the user's television and videocassette recorder. The program guide system is therefore not portable. As a  
10 result, the user cannot use the program guide to adjust program reminder settings, to select programs for recording, to purchase pay-per-view programs, or to perform other program guide functions without that user being physically located in the same room in the home.

15           On-line program guides allow users to view program listings using a web-browser. However, the on-line program guides that are available on the Internet do not provide the versatility of in-home program  
20 guides. For example, on-line program guides do not allow the user to set in-home reminders for programming, to adjust parental control settings, or to select programs for recording on the user's videocassette recorder.

          On-line program guides have also been  
25 implemented that allow users to order pay-per-view programs. Such systems allow users to order programs via a web server as opposed to via the telephone or using impulse ordering. A third party takes orders via the internet, bills the user, and provides ordering  
30 information to the headend. The headend authorizes the user's set-top to view the ordered program using conventional signal denial or signal scrambling systems without coordinating the ordering of the pay-per-view

program with an in-home guide. Ordering pay-per-view programs in this manner (i.e., without coordinating the order with an in-home guide), does not provide users with many of the benefits of ordering pay-per-views  
5 through an in-home guide, such as upcoming program reminders or missed program reminders. Users are also not prevented from attempting to order a pay-per-view program with a guide after the program has been ordered.

10 Program guides that run on personal computers are also available. Such programs guides are useful for users who wish to view program listings information, but who cannot readily access their set-top-box-based program guide. For example, another  
15 member of the user's household may be watching television and therefore dominating the use of the set-top box and television. Because there is no way for the user of such a personal computer program guide to coordinate the operation of the personal computer  
20 program guide with the operation of the set-top box program guide, the user of a personal computer program guide is not able to use the personal computer program guide to set in-home reminders for programming, to adjust parental control settings, to select programs  
25 for recording on the user's videocassette recorder, or to purchase pay-per-view programs.

Presently existing program guide systems therefore require that the user be physically present in the home to access important program guide features  
30 such as program reminders, parental control, and program recording.

It is therefore an object of the present invention to provide an interactive television program

guide system in which the program guide may be remotely  
accessed by the user. Such a system may allow the user  
to access important features of the user's in-home  
program guide from a remote location and set program  
5 guide settings for those features.

#### Summary of the Invention

This and other objects of the present  
invention are accomplished in accordance with the  
principles of the present invention by providing an  
10 interactive television program guide system with remote  
access. A local interactive television program guide  
is implemented on interactive television program guide  
equipment. The interactive television program guide  
equipment is connected to one or more remote program  
15 guide access devices over a remote access link. A  
remote access interactive television program guide is  
implemented on the remote program guide access device.  
The remote program guide and remote program guide  
access devices provide users with the opportunity to  
20 remotely access features of the interactive television  
program guide on the interactive television program  
guide equipment and to remotely set program guide  
settings.

Any suitable interactive television program  
25 guide function or setting may be accessed. The remote  
access program guide may, for example, provide the user  
with an opportunity to remotely schedule a reminder for  
a program, remotely view television program listings,  
remotely select programming for recordings (storage),  
30 remotely play a stored program or a currently  
broadcasted program on the remote program guide access  
device, remotely set and navigate through favorites

(e.g., favorite channels, program categories, services, etc.), and remotely set parental control settings.

The remote program guide access device may also provide the user with an opportunity to remotely  
5 perform additional functions such as sending and playing or displaying messages with the interactive television program guide, polling the interactive program guide for status information, and storing interactive television program guide data at the remote  
10 program guide access device.

Providing remote access to these and other features may allow users to control television related activity in ways and in situations in which the users could not do so before. A person who is caught in  
15 traffic in an automobile may, for example, access the program guide using appropriate voice commands to access listings for programs that the user anticipates he or she will not arrive home in time to view. The listings may be displayed on a screen, or recited back  
20 to the user in synthesized voice listings. The user may select any such programs for recording on their videocassette recorder or other storage device in the home, or on a server at a television distribution facility or other distribution facility. Systems in  
25 which users store programs on a remote server are described, for example, in Ellis et al. U.S. patent application Serial No. 09/332,244, filed June 11, 1999 (Attorney Docket No. UV-84), which is hereby incorporated by reference herein in its entirety.

30 A parent may, for example, access the program guide while at work to see if a child is watching television. If the child should not be watching television, the parent may cause the program guide to

display a message to the child (e.g., "Go do your homework!") and then may prevent viewing via a parental control feature. On the other hand, if television viewing is prevented by default (e.g., prevented until  
5 the parent arrives home), then the parent may remotely access the program guide to allow a child to watch television.

A person at work may, for example, receive a call from a spouse or other family member at home who  
10 explains to the person at work that the person at home cannot operate home television equipment as desired (e.g., "I can't program the VCR!"). The person at work may remotely access the program guide, poll for equipment status information, and perform the desired  
15 function.

If desired, non-program-guide applications may be implemented on the user television equipment. Such non-program-guide applications may include, for example, a web browser application, a home shopping  
20 application, a game application, an e-mail application, a chat application, a banking application, etc. These applications may be implemented on a set-top box within the user television equipment. The user may adjust the settings of such a non-program-guide application using  
25 a remote access device.

Further features of the invention, its nature and various advantages will be more apparent from the accompanying drawings and the following detailed description of the preferred embodiments.

Brief Description of the Drawings

FIG. 1 is a schematic block diagram of an illustrative system in accordance with the present invention.

5           FIGS. 2a-2d show illustrative arrangements for the interactive television program guide equipment and remote program guide access device of FIG. 1 in accordance with the principles of the present invention.

10           FIG. 3 is an illustrative schematic block diagram of the user television equipment of FIG. 2 in accordance with the principles of the present invention.

15           FIG. 4 is a generalized schematic block diagram of portions of the illustrative television equipment of FIG. 3 in accordance with the principles of the present invention.

20           FIG. 5 is a schematic block diagram of an illustrative remote program guide access device in accordance with the principles of the present invention.

25           FIGS. 6a, 6b, and 6c are schematic block diagrams of illustrative arrangements for supporting communications between a remote program guide access device and interactive television program guide equipment over an Internet link in accordance with the principles of the present invention.

30           FIGS. 7 and 8 are illustrative remote program guide access device display screens in accordance with the principles of the present invention.

FIG. 9 is an illustrative program reminder for display by interactive television program guide equipment or a remote program guide access device in

accordance with the principles of the present invention.

FIG. 10 is an illustrative favorites screen for display by a remote program guide access device in accordance with the principles of the present invention.

FIG. 11 is an illustrative status display screen for display by a remote program guide access device in accordance with the principles of the present invention.

FIGS. 12-23 are illustrative flow charts of steps involved in providing remote access to interactive television program guide features in accordance with the principles of the present invention.

FIG. 24 is an illustrative Internet browser screen for display by a remote access device in accordance with the principles of the present invention.

FIG. 25 is an illustrative shopping data entry screen for display by a remote access device in accordance with the principles of the present invention.

FIG. 26 is an illustrative stock ticker data entry screen for display by a remote access device in accordance with the principles of the present invention.



Detailed Description of the Preferred Embodiments

An illustrative system 10 in accordance with the present invention is shown in FIG. 1. Main facility 12 provides interactive television program guide data from program guide data source 14 to interactive television program guide equipment 17 via communications link 18. There are preferably numerous pieces or installations of interactive television program guide equipment 17, although only one is shown in FIG. 1 to avoid over-complicating the drawing. Link 18 may be a satellite link, a telephone network link, a cable or fiber optic link, a microwave link, a combination of such links, an Internet link, or any other suitable communications path.

The interactive television program guide data transmitted by main facility 12 to interactive television program guide equipment 17 may include television program listings data (e.g., program times, channels, titles, and descriptions) and other program guide data for additional services other than television program listings (e.g., pay-per-view information, weather information, associated Internet web links, computer software, etc.). Interactive television program guide equipment 17 may be connected to remote program guide access device 24 via remote access link 19. Interactive television program guide equipment may have more than one associated remote program guide access device 24, although only one such device 24 is shown in FIG. 1 to avoid overcomplicating the drawing.

An interactive television program guide is implemented on interactive television program guide equipment 17. Four illustrative arrangements for

interactive television program guide equipment 17 is shown in FIGS. 2a-2d. As shown in FIGS. 2a-2d interactive television program guide equipment 17 may include program guide distribution equipment 21 located  
5 at television distribution facility 16 and user television equipment 22. Television distribution facility 16 may be any suitable distribution facility (e.g., a cable system headend, a broadcast distribution facility, a satellite television distribution facility,  
10 or any other suitable type of television distribution facility). Television distribution facility 16 may distribute program guide data that it received from main facility 12 to multiple users via communications path 20.

15 Program guide distribution equipment 21 may be any equipment suitable for providing program guide data to user television equipment 22. Program guide distribution equipment 21 may include, for example, suitable transmission hardware for distributing program  
20 guide data on a television channel sideband, in the vertical blanking interval of a television channel, using an in-band digital channel, using an out-of-band digital signal, or by any other suitable data transmission technique. Video signals (e.g.,  
25 television programming) may also be provided by program guide distribution equipment 21 to user television equipment 22 over communications paths 20 on multiple television channels.

FIGS. 2a and 2b show illustrative  
30 arrangements for interactive television program guide equipment 17 and remote program guide access device 24 in systems in which program guide data is provided to user television equipment 22 using a non client-server

based approach. For example, program guide data may be provided by television distribution facility 16 to user television equipment 22 in a continuous stream or may be transmitted at a suitable time interval (e.g., once  
5 per hour). If transmitted continuously, it may not be necessary to store data locally at user television equipment 22. Rather, user television equipment 22 may extract data "on the fly" as it is needed. If desired, television distribution facility 16 may poll user  
10 television equipment 22 periodically for certain information (e.g., pay program account information or information regarding programs that have been purchased and viewed using locally-generated authorization techniques).

15 In the system configuration of FIG. 2a, remote program guide access device 24 is connected to user television equipment 22. Television distribution facility 16 may distribute program guide data to user television equipment 22. User television equipment 22  
20 may transfer the program guide data to remote program guide access device 24. User television equipment 22 may also transfer additional data that may be necessary for allowing remote program guide access device 24 to access various functions of the interactive program  
25 guide (e.g., reminder information, parental control settings, favorite channel settings, user profiles, etc.). Any suitable distribution scheme may be used. For example, user television equipment 22 may provide the data to remote program guide access device 24  
30 continuously, periodically, using a client-server based approach, using a polling scheme, or using any other suitable approach. Remote program guide access device

24 may store the data if suitable for a particular transmission scheme.

In the system configuration of FIG. 2b, remote program guide access device 24 is connected to television distribution facility 16 via communications device 27. In this approach television distribution facility 16 may distribute program guide data to remote program guide access device 24 directly. Television distribution facility 16 may also distribute additional data from user television equipment 22 that may be necessary for allowing remote program guide access device 24 to access various functions of the interactive program guide (e.g., reminder information, parental control settings, favorite channel settings, user profiles, etc.). Television distribution facility 16 may provide the data to remote program guide access device 24 continuously, periodically, using a client-server based approach, using a polling scheme, or using any other suitable approach. Remote program guide access device may store the data if suitable for a particular transmission scheme.

FIGS. 2c and 2d show illustrative arrangements for interactive television program guide equipment 17 and remote program guide access device 24 in client-server based interactive program guide systems. As shown in FIGS. 2c and 2d, program guide distribution equipment 21 may include program guide server 25. Program guide server 25 may be any suitable software, hardware, or combination thereof for providing a client-server based program guide. Program guide server 25 may, for example, generate program guide display screens as digital frames and distribute the frames to user television equipment 22 for display

by an interactive program guide client implemented on user television equipment 22. In another suitable approach, program guide server 25 may run a suitable database engine, such a SQL server, and provide program  
5 guide data in response to queries generated by user television equipment 22. If desired, program guide server 25 may be located at main facility 12 or at some other facility suitable for providing program guide data via a program guide server (not shown).

10 Remote program guide access device 24 may, for example, communicate with user television equipment 22 over remote access link 19 as shown in FIG. 2c. Requests, commands, or other suitable communications may be provided by remote program guide access device  
15 24 to user television equipment 22 and then forwarded by user television equipment 22 to program guide server 25. Program guide data or display screens provided by program guide server 25 may be forwarded by user television equipment 22 to remote program guide access  
20 device 24.

Alternatively, remote program guide access device 24 may, for example, communicate with program guide server 25 over remote access link 19 via communications device 27 as shown in FIG. 2d.  
25 Appropriate commands, requests, or other suitable communications may be transmitted by remote program guide access device 24 for processing by program guide server 25. If any changes to program guide settings are made (e.g., a change to the parental control  
30 settings), program guide server may, for example, update a local program guide client running on user television equipment 22 with the necessary information.

In the arrangements illustrated in FIGS. 2b and 2d, television distribution facility 16 may have communications device 27 for communicating with remote program guide access device 24 over remote access link 19. Communications device 27 may be, for example, a communications port (e.g., a serial port, parallel port, universal serial bus (USB) port, etc.), modem (e.g., any suitable analog or digital modem, cellular modem, or cable modem), network interface card (e.g., an Ethernet card, token ring card, etc.), wireless transceiver (e.g., an infrared transceiver or other suitable transceiver), or other suitable communications device.

As shown in FIGS. 1 and 2a-2d, interactive television program guide equipment 17 communicates with remote program guide access device 24 via remote access link 19. In practice, remote program guide access device 24 may be connected to user television equipment 22 (as shown in FIGS. 2a and 2c), television distribution facility 16 (as shown in FIG. 2b), connected to both (as indicated in FIG. 1), or may communicate with remote program guide server 25 (as shown in FIG. 2d) via remote access link 19. Remote access link 19 may be any suitable wired or wireless communications path or paths over which digital or analog communications may take place between interactive television program guide equipment 17 and remote program guide access device 24.

Each user has user television equipment 22 for displaying the television program listings information and other program guide data using a local interactive television program guide. There are typically multiple pieces of user television equipment

22 and multiple associated communications paths 20, although only one piece of user television equipment 22 and communications path 20 are shown in FIGS. 2a-2d to avoid overcomplicating the drawing. Television  
5 distribution facility 16 may distribute television programming to user television equipment 22 via communications path 20. If desired, television programming may be provided over separate communications paths (not shown).

10 For clarity, the present invention is illustrated, unless otherwise indicated, in connection with a system arrangement in which program guide data is distributed from a main facility to an interactive television program guide implemented on user television  
15 equipment via a television distribution facility. Other suitable systems involve arrangements in which data is distributed to a program guide on user television equipment using other suitable distribution schemes, such as schemes involving data transmission  
20 over the Internet or the like. If desired, the interactive television program guide application may be implemented using a client-server architecture in which the primary processing power for the application is provided by a server located at, for example, the  
25 television distribution facility or the main facility (e.g., program guide server 25), and user television equipment 22 acts as a client processor as illustrated by FIGS. 2c and 2d. Alternatively, the interactive television program guide may obtain program guide data  
30 from the Internet. On-line program guides are described, for example, in Boyer et al. U.S. patent application Serial No. 08/938,028, filed September 18,

1997, which is hereby incorporated by reference herein in its entirety.

An illustrative arrangement for user television equipment 22 is shown in FIG. 3. User television equipment 22 of FIG. 3 receives video and data from television distribution facility 16 (FIG. 1) at input 26. During normal television viewing, the user tunes set-top box 28 to a desired television channel. The signal for that television channel is then provided at video output 30. The signal supplied at output 30 is typically either a radio-frequency (RF) signal on a predefined channel (e.g., channel 3 or 4), or a analog demodulated video signal, but may also be a digital signal provided to television 36 on an appropriate digital bus (e.g., a bus using the Institute of Electrical and Electronics Engineers (IEEE) 1394 standard, (not shown)). The video signal at output 30 is received by optional secondary storage device 32.

Secondary storage device 32 can be any suitable type of analog or digital program storage device or player (e.g., a videocassette recorder, a digital video disc (DVD) player, a hard-disk based storage device, etc.). Program recording and other features may be controlled by set-top box 28 using control path 34. If secondary storage device 32 is a videocassette recorder, for example, a typical control path 34 involves the use of an infrared transmitter coupled to the infrared receiver in the videocassette recorder that normally accepts commands from a remote control such as remote control 40. Remote control 40 may be used to control set-top box 28, secondary storage device 32, and television 36.



The interactive television program guide may run on set-top box 28, on television 36 (if television 36 has suitable processing circuitry and memory), on secondary storage device 32 or on optional digital storage device 31 (if they have suitable processing circuitry and memory) or on a suitable analog or digital receiver connected to television 36. The interactive television program guide may also run cooperatively on both television 36 and set-top box 28. Interactive television application systems in which a cooperative interactive television program guide application runs on multiple devices are described, for example, in Ellis U.S. patent application Serial No. 09/186,598, filed November 5, 1998, which is hereby incorporated by reference herein in its entirety.

If desired, the user may record programs and program data in digital form on optional digital storage device 31. Digital storage device 31 may be a writable optical storage device (such as a DVD player capable of handling recordable DVD discs), a magnetic storage device (such as a disk drive or digital tape), or any other digital storage device. Interactive television program guide systems that have digital storage devices are described, for example, in Hassell et al. U.S. patent application Serial No. 09/157,256, filed September 17, 1998, which is hereby incorporated by reference herein in its entirety.

Digital storage device 31 can be contained in set-top box 28 or it can be an external device connected to set-top box 28 via an output port and appropriate interface. If necessary, processing circuitry in set-top box 28 formats the received video, audio and data signals into a digital file format.

Preferably, the file format is an open file format such as the Motion Pictures Expert Group (MPEG) MPEG-2 standard. The resulting data is streamed to digital storage device 31 via an appropriate bus (e.g., a bus  
5 using the Institute Electrical and Electronics Engineers (IEEE) 1394 standard), and is stored on digital storage device 31. Digital storage device 31 and secondary storage device 32 may be integrated into a sophisticated set-top box if desired.

10           Television 36 receives video signals from secondary storage device 32 via communications path 38. The video signals on communications path 38 may either be generated by secondary storage device 32 when  
15           playing back a prerecorded storage medium (e.g., a videocassette or a recordable digital video disc), by digital storage device 31 when playing back a pre-recorded digital medium, may be passed through from  
20           set-top box 28, may be provided directly to television 36 from set-top box 28 if secondary storage device 32 is not included in user television equipment 22, or may  
25           be received directly by television 36. During normal television viewing, the video signals provided to television 36 correspond to the desired channel to which the user has tuned with set-top box 28. Video  
30           signals may also be provided to television 36 by set-top box 28 when set-top box 28 is used to play back information stored on digital storage device 31.

          Set-top box 28 may have communications device 37 for communicating with remote program guide access  
30           device 24 over remote access link 19. Communications device 37 may be, for example, a communications port (e.g., a serial port, parallel port, universal serial bus (USB) port, etc.), modem (e.g., any suitable analog

or digital modem, cellular modem, or cable modem), network interface card (e.g., an Ethernet card, token ring card, etc.), wireless transceiver (e.g., an infrared transceiver or other suitable transceiver), or  
5 other suitable communications device. Television 36 may also have such a suitable communications device connected to remote access link 19 if desired.

If desired, there may be multiple installations of user television equipment 22 within  
10 the home connected via an in-home network. This may provide for coordinating the functionality of multiple guides within the home. Systems in which the functionality of multiple guides are coordinated are described, for example, in concurrently filed Ellis  
15 et al. U.S. patent application Serial No. \_\_\_\_\_ (Attorney Docket No. UV-73), which is hereby incorporated by reference herein in its entirety. In such systems, remote program guide access device 24 may be connected via remote access link 19 to one of the  
20 guides and may provide users with the ability to remotely coordinate the functions of all of the guides.

A more generalized embodiment of user television equipment 22 of FIG. 3 is shown in FIG. 4. As shown in FIG. 4, program guide data from television  
25 distribution facility 16 (FIGS. 2a-2d) is received by control circuitry 42 of user television equipment 22. Control circuitry 42 may also send data and commands or requests back to television distribution facility 16. The functions of control circuitry 42 may be provided  
30 using the set-top box arrangement of FIGS. 2a and 2b. Alternatively, these functions may be integrated into an advanced television receiver, personal computer television (PC/TV), or any other suitable arrangement.

If desired, a combination of such arrangements may be used.

The user controls the operation of user television equipment 22 with user interface 46. User interface 46 may be a pointing device, wireless remote control, keyboard, touch-pad, voice recognition system, or any other suitable user input device. To watch television, the user instructs control circuitry 42 to display a desired television channel on display device 45. Display device 45 may be a television, monitor, or other suitable display device. To access the features of the program guide, the user instructs the program guide implemented on interactive television program guide equipment 17 to generate a main menu or other desired program guide display screen for display on display device 45.

User television equipment 22 of FIG. 4 may also have communications device 51 for supporting communications between user television equipment 22 and remote program guide access device 24 over remote access link 19. Communications device 51 may be a communications port (e.g., a serial port, parallel port, universal serial bus (USB) port, etc.), modem (e.g., any suitable analog or digital standard, cellular, or cable modem), network interface card (e.g., an Ethernet card, Token ring card, etc.), wireless transceiver (e.g., an infrared, radio, or other suitable analog or digital transceiver), or other suitable communications device.

User television equipment 22 may also have secondary storage device 47, digital storage device 49, or any suitable combination thereof for recording programming. Secondary storage device 47 can be any

suitable type of analog or digital program storage device (e.g., a videocassette recorder, a digital video disc (DVD), etc.). Program recording and other features may be controlled by control circuitry 42.

5 Digital storage device 49 can be, for example, a writable optical storage device (such as a DVD player capable of handling recordable DVD discs), a magnetic storage device (such as a disk drive or digital tape), or any other digital storage device.

10 An illustrative arrangement for remote program guide access device 24 is shown in FIG. 5. As shown in FIG. 5, remote program guide access device 24 may be any suitable personal computer (PC), portable computer (e.g., a notebook computer), palmtop computer, 15 handheld personal computer (H/PC), display remote, touch-screen remote, automobile PC, personal digital assistant (PDA), or other suitable computer based device. Remote program guide access device 24 may have user interface 52, processing circuitry 54, storage 56, 20 and communications device 58. User interface 52 may be any suitable input or output device or system, and may include a pointing device, keyboard, touch-pad, touch screen, pen stylus, voice recognition system, mouse, trackball, cathode ray tube (CRT) monitor, liquid 25 crystal display (LCD), voice synthesis processor and speaker, or any other suitable user input or output device. Processing circuitry 54 may include any suitable processor, such as an Intel 486 or Pentium® microprocessor. Remote program guide access device 24 30 may also have storage 56. Storage 56 may be any suitable memory or other storage device, such as RAM, ROM, flash memory, a hard disk drive, etc.

Remote program guide access device 24 may also have communications device 58. Communications device 58 may be any device suitable for supporting communications between remote program access device 24  
5 and interactive television program guide equipment 17 over link 19, such as a communications port (e.g., a serial port, parallel port, universal serial bus (USB) port, etc.), modem (e.g., any suitable analog or digital standard modem or cellular modem), network  
10 interface card (e.g., an Ethernet card, token ring card, etc.), wireless transceiver (e.g., an infrared, radio, or other suitable analog or digital transceiver), or other suitable communications device.

Remote access link 19 (FIG. 1) may include  
15 any suitable transmission medium. Link 19 may include, for example, a serial or parallel cable, a dial-up telephone line, a computer network or Internet link (e.g., 10Base2, 10Base 5, 10BaseT, 100BaseT, 10BaseF, T1, T3, etc.), an in-home network link, an infrared  
20 link, a radio frequency link, a satellite link, any other suitable transmission link or suitable combination of such links. Any suitable transmission or access scheme may be used such as standard serial or parallel communications, Ethernet, Token Ring, Fiber  
25 Distributed Data Interface (FDDI), Circuit-Switched Cellular (CSC), Cellular Digital Packet Data (CDPD), RAM mobile data, Global System for Mobile communications (GSM), time division multiple access (TDMA), code division multiple access (CDMA), any other  
30 suitable transmission or access scheme, or any suitable combination thereof. Preferably remote access link 19 is bidirectional. If desired, however, certain limited program guide functions may be accessed using a

unidirectional link. An advantage of using a unidirectional scheme for link 19 is that such schemes are generally less complicated and then less expensive than bidirectional links.

5 Remote program guide access device 24 and interactive television program guide equipment 17 may communicate over remote access link 19 using any suitable network and transport layer protocols, if desired. Remote program guide access device 24 and  
10 interactive television program guide equipment 17 may communicate, for example, using a protocol stack which includes Sequenced Packet Exchange/Internetwork Packet Exchange (SPX/IPX) layers, Transmission Control Protocol/Internet Protocol (TCP/IP) layers, Appletalk  
15 Transaction Protocol/Datagram Delivery Protocol (ATP/DDP) layers, or any other suitable network and transport layer protocols or combination of protocols.

Remote program guide access device 24 may communicate with interactive television program guide  
20 equipment 17 using any suitable scheme. Remote program guide access device 24 may, for example, connect to interactive television program guide equipment 17 using a terminal emulation scheme, such as VT100 terminal emulation, and access the interactive television  
25 program guide as if it were a "dumb terminal." Remote program guide access device 24 may, for example, run a standard remote access client such as a Windows® Remote Access Services (RAS) client and may connect to a Windows NT® Server process running on interactive  
30 television program guide equipment 17. Any suitable combination of hardware and software may be used. In addition to using any of the already mentioned protocols, any number of other access, data-link,

network, routing or other protocols may be involved in supporting communications between remote program guide access device 24 and television distribution facility 16 over remote access link 19 (e.g., X.25, Frame Relay, Asynchronous Transfer Mode (ATM), Serial Line Interface (SLIP), point-to-point protocols (PPP), or any other suitable access, data-link, network, routing or other protocol).

FIGS. 6a and 6b show illustrative arrangements for supporting communications between remote program guide access device 24 and interactive television program guide equipment 17 over an Internet link. Television distribution facility 16 may, for example, include Internet service system 61 for providing Internet-based access to the program guide. Internet service system 61 may be any combination of hardware and software capable of providing an Internet connection to the programming guide. Remote program guide access device 24 may establish an Internet session with Internet service system 61 and thereby obtain program guide data from or set program guide settings with (e.g., set reminders or notifications, view listings, schedule program recording, set favorites, set parental control features, send messages, poll interactive television program guide equipment 17, etc.) the program guide running on interactive program guide equipment 17. If desired, Internet service system 61 may be located at a facility that is separate from television distribution facility 16.

Program guide server 25 may, in turn, interact with the user's client device (e.g., user television equipment 22). If the program guide is



implemented on user television equipment 22 of program  
guide equipment 17 as shown in FIG. 6a, Internet  
service system 61 (or other suitable equipment at  
television distribution facility 16 that is connected  
5 to Internet service system 61) may interact with user  
television equipment 22 directly or via program guide  
distribution equipment 21 when supporting  
communications between the program guide and the remote  
program guide access device. If the program guide  
10 implemented on interactive television program guide  
equipment 17 is a client-server guide as shown in FIG.  
6b, Internet service system 61 may interact with  
program guide server 25 when supporting communications  
between the program guide and the remote program guide  
15 access device 24. Alternatively, Internet service  
system 61 and program guide server 25 may be the same  
device or system.

In an illustrative system configuration using  
Internet service system 61, remote program guide access  
20 device 24 is a user's personal computer at work,  
Internet service system 61 is a web server at a cable  
system headend, and user television equipment 22 at the  
user's home contains a set-top box on which the user's  
program guide is implemented. Using this arrangement,  
25 the user may access features of the program guide such  
as setting reminders or notifications, viewing  
listings, program recording, setting favorites,  
parental control, sending messages, polling for status,  
or any other suitable function. For example, if a  
30 child in the user's home desires permission to watch a  
parentally controlled program while the user is at  
work, the user may access a suitable web page provided  
by Internet service system 61 that allows the user to

enter a password and adjust the program guide parental control settings. The changed settings allowing the child access to the desired program are then automatically transferred from Internet service system 5 61 to user television equipment 22, while the user is still at work.

As another example, the user at work may interact with the program guide on user television equipment 22 via Internet service system 61 to select 10 programs for recording on the user's home videocassette recorder, or to schedule program reminders that will appear on the user's home television or remote program guide access device just before a program is broadcast.

FIG. 6c shows another illustrative 15 arrangement for remote program guide access using the Internet. In the system arrangement of FIG. 6c, users do not directly communicate a local guide via the Internet as with the arrangements of FIG. 6a and 6b. Instead, users may have personal computer (PC) 231 as 20 their remote access device on which a web browser is implemented for accessing an on-line program guide. On-line program guides are described, for example, in above-mentioned Boyer et al. U.S. patent application Serial No. 08/938,028, filed September 18, 1997. 25 Personal computer 231 may be connected to Internet service system 235 via Internet link 233. Internet service system 233 may use any suitable combination of computer hardware and software capable of providing an on-line program guide server application or web site. 30 The user may access a personal web page and set various program guide settings and access various program guide functions. The user may, for example, set favorite channels, set parental control settings, schedule

programs for play back or recording by the user's television equipment. After the user has set various program guide settings or accessed various program guide functions via a web page, Internet service system 5 235 may provide the settings and another program guide information to Internet service system 61 for distribution by program guide server 25 or distribution equipment 21 (as shown) to user television equipment 22. The local guide updates its settings, records 10 programs, plays back programs, or performs any other suitable function accordingly. The local guide may also order pay-per-view programs.

A remote access interactive television program guide may, for example, be implemented on 15 remote program guide access device 24. The remote access interactive television program guide may communicate with the interactive television program guide that is implemented on interactive television program guide equipment 17, herein referred to as a 20 "local" interactive television program guide. The remote access and local guide may, for example, be the same guide but compiled to run on two different platforms and to communicate in a manner or manners discussed herein. Alternatively, the remote access 25 guide may be a client guide that communicates with the local guide (i.e., a server guide). In still another suitable approach, the two guides may be different guides that communicate in a manner or manners discussed disclosed herein. Generally, although not 30 necessarily (e.g., when remote program guide access device 24 is a personal computer as shown in FIG. 6c), the remote access interactive television program guide may have a reduced or limited functionality when

compared to the functionality of the local interactive television program guide. Accordingly, the remote access guide may require less processing power and memory of remote program guide access device 24 than  
5 the local guide requires of interactive television program guide equipment 17.

Program guide information (e.g., reminder information, listings information, recording information, message information, status information,  
10 parental control settings, audio and video, status or polling information, user information, favorites settings, or any other information necessary for remotely providing program guide functionality) may be exchanged, and settings set, between the two  
15 interactive television program guides over remote access link 19 using one or more access communications.

Access communications may include, for example, commands, requests, messages, remote procedure calls (e.g., using a proxy-stub pair), or any other  
20 suitable client-server or peer-to-peer communication. Access communications may also involve, for example, complex communications between application constructs running on remote program guide access device 24 and interactive television program guide equipment 17.  
25 Objects running in the two versions of the program guides, for example, may communicate using an Object Request Broker (ORB). The program guide information may, for example, be encapsulated as component object model (COM) objects and persisted to files that are  
30 transmitted over remote access link 19. In another approach, access communications may include HTML formatted markup language documents (e.g., web pages), that are exchanged between remote program guide access

device 24 and interactive television program guide equipment via Internet service system 61.

Program guide information may be transferred, and program guide settings set, between remote program guide access device 24 and interactive television program guide equipment 17 using any suitable application layer protocol if desired. If link 19 is an Internet link, for example, program guide functionality may be accessed by, for example, using the Hypertext Transfer Protocol (HTTP). Remote program guide access device 24 and interactive television program guide equipment 17 may, for example, transfer program guide information as files using the File Transfer Protocol (FTP) or Trivial File Transfer Protocol (TFTP), running over a TCP/IP protocol stack. Any suitable file transfer protocol based on any suitable protocol stack may be used.

Remote program guide access device 24 and interactive television program guide equipment 17 may also exchange program guide data and other information as messages using any suitable messaging scheme or messaging application programming interface (API). Program guide data and other information may, for example, be encapsulated into e-mail messages and transferred using the Simple Mail Transfer Protocol (SMTP), Messaging API (MAPI), or other suitable messaging protocol or API.

Remote program guide access device 24 and the interactive television program guide implemented on interactive program guide equipment 17 may exchange access communications to provide the user with access to program guide functionality as if the program guide were running locally on remote program guide access

device 24. Remote program guide access device 24 may provide a user with access to any number of program guide functions such as accessing programming information, scheduling reminders for programs, setting  
5 and navigating through favorite channels, setting parental control settings, scheduling programming recordings, or any other program guide function to the extent allowed by the resources of remote program guide access device 24. If desired, remote program guide  
10 access device 24 may allow the user to perform other program guide functions, such as determining the status of user television equipment 22, sending messages to user television equipment 22, interacting with peripherals connected to user television equipment, and  
15 other suitable functions.

When the user wishes to access the features of the program guide via remote program guide access device 24, the user may issue an appropriate command using user interface 52 (FIG. 5). For example, if the  
20 user wishes to view programming information, a "guide" key on user interface 52 can be used. If, for example, user interface 52 includes a microphone and uses suitable voice recognition software, the user may speak a predetermined command into the microphone. Such an  
25 interface is especially useful in environments where remote program guide access device 24 must be operated without the use of one's hands, as with an automobile PC.

When possible, remote program guide access  
30 device 24 may present program guide data and other information to the user as they are normally presented by user television equipment 22. In practice, appropriate differences in presentation may occur

depending on the interface devices used in user television equipment 22 and remote program guide access device 24 (e.g., user television equipment 22 may use a television to output listings and remote program guide  
5 access device 24 may include a voice recognition and synthesis system to output synthesized voice listings).

When a user indicates a desire to access program guide features by issuing an appropriate command to remote program guide access device 24,  
10 remote program guide access device 24 may, for example, access stored program guide information or obtain program guide information from interactive television program guide equipment 17 via remote access link 19 using any of the approaches already described, and  
15 generate an appropriate display screen for display using user interface 52. Alternatively, the local interactive television program guide implemented on interactive television program guide equipment 17 may receive one or more access communications from remote  
20 program guide access device 24 over link 19, generate the appropriate program guide display screen, and send the program guide display screen back to remote program guide access device 24 for display on user interface 52. In another embodiment, a remote access guide may  
25 run on remote program guide access device 24 and issue access communications over remote access link 19 as if it were running as a client locally on interactive television program guide equipment 17. In another embodiment, remote program guide access device 24 may  
30 access a web site and view web pages that contain program guide information.

The remote access program guide running on remote program guide access device 24 may provide a

user with an opportunity to remotely access program listings. A person driving an automobile, for example, may issue a suitable vocal command that is recognized by interface 52. The remote access program guide may  
5 issue one or more access communications to the local program guide, which in turn supplies program listings information back to remote program guide access device 24. User interface 52 may, for example, provide the listings to the user in synthesized voice outputs.

10 The program listings may also, for example, be displayed in a program listings screen by a suitable display device. A program listings screen may contain one or more lists of programs organized according to one or more organization criteria (e.g., by program  
15 type, theme, or any other predefined or user defined and selectable criteria) and sorted in various ways (e.g., alphabetically). One approach is to organize program listings into a program listings grid. As shown in FIG. 7, program listings display screen 148  
20 may contain program listings area 168. Program listings area 168 may display television program listings in any suitable format, such as any suitable list, table, or grid.

FIG. 7 illustrates the display of program  
25 listings in program listings grid 150. Program listings grid 150 may be divided into a number of columns 162 which correspond to program broadcast times and which may be equally spaced apart (e.g., in thirty-minute steps). Program listings may be displayed in  
30 the grid in sub-sets according to predefined or selectable organization criteria and sorted in various ways. Program listings row 152 contains, for example, selectable program listings for THE DESERTS OF AFRICA



and WILDLIFE on channel 46 (Public Television).  
Program listings row 154 contains, for example,  
selectable program listings for GHOST and TITANIC on  
channel 47 (HBO). Program listings row 156 contains,  
5 for example, selectable program listings for programs  
BLUES BROTHERS on channel 48 (VH-1). Program listing  
row 158 contains selectable program listings for  
programs, PPV 1, and PPV 2 on channel 49 (ADU).  
Program listings row 160 contains a selectable program  
10 listing for COOKING on channel 50 (WPTU). The programs  
on each channel are typically different.

Program listings grid 150 may have movable  
cell highlight region 151, which highlights the current  
grid cell. The user may position highlight region 151  
15 by entering appropriate commands with user interface  
52. For example, if user input interface 52 has a  
keypad, the user can position highlight region 151  
using "up," "down," "left," and "right" cursor keys.  
Remote program listings may also be panned left, right,  
20 up, and down by positioning highlight region 151 using  
the cursor keys on user interface 52. Alternatively, a  
touch sensitive screen, trackball, voice commands, or  
other suitable device may be used to move highlight  
region 151 or to select program listings without the  
25 use of highlight region 151. In still another  
approach, the user may speak the title of a television  
program listing into a voice request recognition system  
which will issue an appropriate command or request to  
remote program guide access device 24. Any other  
30 suitable approach may also be used.

After a user selects a program listing, the  
remote access program guide may provide the user with  
the opportunity to access a number of program guide

features. For example, the user may access additional information (typically text or graphics, but possibly video if desired) about the listing, schedule an associated program reminder, schedule an associated  
5 program for recording by one or more of digital storage device 31 (FIG. 3), secondary storage device 32 (FIG. 3), storage 56 (FIG. 5), or program guide server 25.

Program listings may also be displayed for  
10 the user in a list. FIG. 8 illustrates a program listings display screen having a program listings list displayed in accordance with the principles of the present invention. Scrollable program listings lists may display program listings in subsets according to  
15 predefined or user-selected organization criteria. Any suitable organization criteria and sorting scheme may be used. Scrollable program listings list 170 of FIG. 8, for example, organizes program listings according to program type and then sorts the listings  
20 alphabetically in each subset. The television program listings display screen of FIG. 8 also has movable cell highlight region 171 for moving within the list and selecting listings.

The remote access program guide may also  
25 provide a user with the opportunity to remotely schedule program reminders when the user indicates a desire to set a program reminder (e.g., by pressing a "reminder" button on user interface 52, selecting an on screen "reminder" button, issuing an appropriate vocal  
30 command, etc.). The remote access program guide may transmit one or more access communications to the local interactive television program guide implemented on interactive television program guide equipment 17 to

schedule the reminder. Alternatively, the remote access program guide may, for example, store a reminder locally on storage 56 of remote program guide access device 24 (FIG. 5). Information indicating the user  
5 who set the reminder may also be stored on interactive program guide equipment 17 or storage 56. Reminders may also be scheduled by a user with the local guide, transmitted to remote program guide access device 24, and displayed by the remote access guide on remote  
10 program guide access device 24.

At an appropriate time before the selected program is scheduled to air (e.g., a predefined user-selectable number of minutes, hours or days), a reminder may be issued by the local or remote  
15 interactive television program guides, or both. The reminder may be issued on all remote program guide access devices 24 available to the user, and may be displayed (e.g., in the form of a pop-up window or message) on user television equipment 22. If a  
20 reminder for a program is to be displayed on the user's home television, the reminder may be displayed just before the beginning of the program. If a reminder for a program is to be displayed on remote program guide access device 24, the reminder may be displayed much  
25 earlier (e.g., several hours before the program).

In another approach, reminders may be sent as e-mail messages from the interactive television program guide to remote program guide access device 24. Interactive program guide systems in which reminders  
30 are sent to users via e-mail are described, for example, in Boyer et al. U.S. patent application Serial No. 08/987,740, filed December 9, 1997, which is hereby incorporated by reference herein in its entirety. In

still another approach, user interface 52 may include an alphanumeric pager (among other suitable devices for providing bi-directional communications with the program guide via remote access link 19). The  
5 interactive program guide implemented on interactive television program guide equipment 17 may phone an automatic paging service (e.g., by using a suitable modem and communications software), and issue a message similar to the one contained in notification 177. An  
10 illustrative reminder 177 for display on display device 45 (FIG. 4) or user interface 52 (FIG. 5) is shown in FIG. 9.

The remote access program guide may also provide a user with the opportunity to remotely access  
15 and adjust the parental control settings of the local interactive television program guide implemented on interactive television program guide equipment 17. The remote access program guide, for example, may provide users with an opportunity to block potentially  
20 objectionable programs or channels using a parental control code (e.g., a personal identification number (PIN) code). Users may also selectively unlock blocked channels or programs. If desired, the user may remotely access parental control settings related to  
25 blocking the display of potentially objectionable program listings.

The remote access program guide may obtain parental control information (e.g., which channels, services, programs, genres or types of program listings  
30 may be locked, maximum rating information, PIN information, etc.), from the local program guide implemented on interactive television program guide equipment 17 over remote access link 19 in any suitable

manner. Remote program guide access device 24 may, if desired, store parental control information on storage 56. Information indicating the user who accessed and adjusted parental control settings may be stored by the  
5 program guide or remote program guide access device 24.

Remote program guide access device 24 may provide a user with the opportunity to remotely parentally control television programming by, for example, providing the user with the opportunity to  
10 select a television program listing and issue an appropriate command using user interface 52 (e.g., by pressing a displayed "lock" button, using a pointing device or touch sensitive screen, issuing an appropriate vocal command, etc.). Remote program guide  
15 access device 24 may indicate to a user that a channel, service, program, or genre is locked by, for example, generating an appropriate notice, icon, synthesized voice response, message, or any other suitable indication. FIGS. 7 and 8 illustrate the use of lock  
20 icon 310 for indicating, for example, that television service ADU is locked.

The remote access program guide may also provide users with an opportunity to remotely access interactive television program guide functionality  
25 related to user preferences or "favorites" settings. For example, remote program guide access device 24 may access features for setting-up and navigating through favorite channels or programs. Interactive television program guide systems in which program guide data is  
30 displayed according to preference profiles are described, for example, in Ellis et al. U.S. patent application Serial No. 09/034,934, filed March 4, 1998,

which is hereby incorporated by reference herein in its entirety.

5 The remote access program guide may obtain information on the user's preferences (e.g., which channels or programs are favorites, favorite themes, likes and dislikes etc.) from the local interactive television program guide implemented on interactive television program guide equipment 17 in any suitable manner. The remote access program guide may, if  
10 desired, store favorites information on storage 56 (FIG. 5), may provide the user with an opportunity to remotely adjust channel settings and other preferences based on the favorites information. Remote program guide access device 24 may transmit changed or new  
15 favorites information to interactive television program equipment 17 via remote access link 19 using one or more access communications. Information indicating the user who changed the profiles may also be stored by the local or remote access program guides.

20 The information on the user's preferences may be used by the local and remote access interactive program guides to navigate through favorite channels and display television program listings. FIG. 10 shows an illustrative program listings display screen that  
25 may be displayed by the remote access program guide on remote program guide access device 24 using user interface 52. The display screen includes a number of channels that have been selected as favorites (e.g., channels 2, 4, 7, 47 and 48). Alternatively, remote  
30 program guide access device 24 may, for example, display television program listings in a grid, table, or list while highlighting favorite channels or preferred programs. A user may be provided with the

opportunity to "scroll" between favorite listings or channels by issuing an appropriate command using user interface 52. In still another suitable approach, remote program guide access device 24 may display  
5 program guide data for only those programs or channels that are of interest to users as defined by the profiles.

User preference profiles may also be used to limit the amount of data provided to remote program  
10 guide access device 24 and thereby tend to minimize the bandwidth requirements of remote access link 19. Data filtering may be performed, for example, by the local interactive guide according to the user profiles when transferring data to remote program guide access  
15 device 24. Only data for those programs or channels that are of interest to the user may be transferred if desired. Alternatively, data filtering may be performed, for example, by program guide server 25 or Internet service system 61.

20 The remote access program guide may also provide the user with the opportunity to remotely schedule recordings using the local interactive program guide. The user may, for example, select a program listing using user interface 52 (FIG. 5) and issue an  
25 appropriate command (e.g., pushing an on-screen "button," issuing an appropriate voice command, etc.). The remote access program guide may respond by sending one or more access communications to the local  
30 interactive program guide implemented on interactive television program guide equipment 17 with the remote program guide access device 24 to record the program associated with the selected listing when the program is aired. The local program guide may store the

program on secondary storage device 32, digital storage device 31, or on storage 56 of remote program guide access device 24. Information indicating the user who scheduled a program for recording may also be stored by  
5 the program guide or remote program guide access device 24. If the programming is stored on storage 56, it may be transmitted to remote program guide access device 24 in any suitable format (e.g., as National Television Standards Committee (NTSC) video, as MPEG-2  
10 files, etc.), and may be converted to a digital format by a suitable analog to digital converter in remote program guide access device 24 if necessary (not shown). Any suitable transmission scheme may be used, such as using FTP if files are transferred, for  
15 example, across an Internet link. Programs may also be recorded by program guide server 25. Program guide systems in which user selected programs are stored by a program guide server are described, for example, in above-mentioned Ellis et al. U.S. patent application  
20 Serial No. 09/332,244, filed June 11, 1999.

If desired, program series may be recorded. Interactive television program guide systems in which program series are recorded are described, for example, in Knudson et al. U.S. patent application Serial No.  
25 09/330,792, filed June 11, 1999, which is hereby incorporated by reference herein in its entirety.

Program guide information may also be stored by the remote access interactive television program guide on storage 56. User settings and profiles, video  
30 clips, and detailed descriptive information may also be stored. Storing programming or data on storage 56 may be appropriate in situations, for example, where the data is required to be maintained across a power



outage, or if the volume of data that the interactive program guide must store during normal operation is more than interactive television program guide equipment 17 can handle.

5           The remote access program guide may also provide a user with an opportunity to remotely order pay-per-view programs and packages. The remote access program guide may, for example, provide the user with an opportunity to select a pay-per-view program or  
10 package listing using user interface 52 (e.g., by using a pointing device, touch sensitive screen, or issuing a voice command to select a pay-per-view program listing). In response to the user command, remote program guide access device 24 may obtain pay-per-view  
15 information (e.g., price, ordering information, time, event code, etc.) from the interactive television program guide running on interactive television program guide equipment 17, via remote access link 19. Alternatively, the pay-per-view information may have  
20 been provided to remote program guide access device 24 by the local guide, program guide server 25, or Internet Service system 61.

          The remote access program guide may provide the pay-per-view information to the user using user  
25 interface 52, and may provide the user with the opportunity to order the pay-per-view selection. Once the user issues an appropriate command to remote program guide access device 24 to order the pay-per-view selection, the remote access guide on remote  
30 program guide access device 24 may indicate to the local guide implemented interactive program guide equipment 17 (e.g., via one or more access communications) the program that the user wishes to

order. The local interactive program guide may respond by ordering the pay-per-view program from television distribution facilitating 16 or some other distribution facility. Alternatively, the remote access program

5 guide may order the pay-per-view program from television distribution facility 16 (or some other distribution facility) and indicate the ordered pay-pay-view to the local guide so that ordering related functions may be coordinated.

10               Remotely ordering pay-per-view programs via the local interactive guide as opposed to ordering pay-per-view programs directly from a headend by phone, internet, or impulse ordering using the remote access guide may allow the local program guide to perform

15 functions that it would not ordinarily be able to perform. Ordering a pay-per-view through the local guide as opposed to directly from television distribution facility 16 may allow the local guide to, for example, parentally control the ordering of a

20 program, inform the user that the program is about to start, inform the user that the user has missed an ordered pay-per-view program, provide the user with an opportunity to reorder the program, or any other suitable function associated with ordering a pay-per-

25 view program.

              The remote access program guide may also provide the user with an opportunity to remotely access video and audio (either together or separately) that is being distributed to the local interactive television

30 program guide or which has been stored by the local interactive television program guide on user television equipment 22 or at a remote server. In response to an appropriate user command on user interface device 56,

the remote access program guide may, for example, query the interactive television program guide for media directory information stored on digital storage device 31 or secondary storage device 32. Interactive  
5 television program guides which store programming using a digital media directory are described, for example, in the previously mentioned Ellis et al. U.S. patent application Serial No. 09/157,256.

The remote access program guide may provide  
10 the user with the opportunity to select a directory entry or may, for example, provide the user with an opportunity to select a program listing of a television program that is being broadcast. In response to either selection, the remote access program guide may issue an  
15 appropriate access communication to the interactive television program guide to play back or tune to the selection and transmit it back to remote program guide access device 24 over remote access link 19. Remote program guide access device 24 may play the video or  
20 audio for the user. In one approach, for example, remote program guide access device 24 may provide a user with the opportunity to access audio from a digital music channel which is received by interactive television program guide equipment 17, and play the  
25 audio on a speaker or by using an audio device that may be contained in user interface 52 (e.g., a car stereo).

Video and audio may be transmitted from interactive television program guide equipment 17 to remote program guide access device 24 over remote  
30 access link 19 in any suitable format (e.g., as NTSC video, as MPEG-2 files, using the M-bone, etc.), and may be converted to a digital format if necessary by a suitable analog to digital converter in remote program

guide access device 24 (not shown). Any suitable transmission scheme may be used.

The remote access program guide may also provide a user with the opportunity to poll the local  
5 interactive television program guide to determine the status of interactive television program guide equipment 17 or, more specifically, user television equipment 22. For example, the remote access program guide may obtain information regarding whether the  
10 interactive television program guide is in use, what channel user television equipment 22 is tuned to, the title of the current program, the rating of the current program, the status of remote access link 19, available devices, etc. Any suitable scheme may be used, such as  
15 using a Simple Network Management Protocol (SNMP) approach in which a management client process runs as part of the interactive television program guide implemented on interactive television program guide equipment 17, and in which a management server process  
20 runs on remote program guide access device 24.

When the user issues an appropriate command using user interface device 56 (e.g., by pressing a button on a key pad, selecting an on-screen option or button, issuing an appropriate voice command, etc.),  
25 the remote access program guide may respond by issuing an access communication to the interactive program guide over remote access link 19 using remote program guide access device 24. The interactive program guide may respond by transmitting the desired status  
30 information back to remote program guide access device 24 over remote access link 19, or by transmitting a display screen (if appropriate). The remote access program guide may indicate the status of interactive

television program guide equipment 17 on remote program  
guide access device 24 using any suitable indicator  
(e.g., a display screen, synthesized voice responses,  
etc.). An illustrative status display screen 200 for  
5 display using user interface 52 is shown in FIG. 11.

The remote access program guide may also  
provide a user with an opportunity to control user  
television equipment 22 remotely. A user may, for  
example, position highlight region 201 over a setting,  
10 select the setting, and change its value. The user  
may, for example, change the current channel, the  
current volume, or control user television equipment 22  
in any other suitable manner.

The remote access program guide may also  
15 provide a user with the opportunity to send audio,  
graphical, and text messages to the local interactive  
program guide for playing or display by user television  
equipment 22. For example, the remote access program  
guide may receive a voice message from the user using  
20 user interface device 24. That voice message may be  
converted to a digital signal by an analog-to-digital  
converter in remote program guide access device 24 if  
necessary, and sent to the interactive television  
program guide over remote access link 19. Once  
25 received, the local interactive television program  
guide may play (or display) the message on user  
television equipment 22. If desired, messages created  
by a user on the local interactive television program  
guide or by an operator of television distribution  
30 facility 16 may be sent to remote program guide access  
device 24. The remote access program guide may in turn  
provide the messages to the user using remote program  
guide access device 24.

FIGS. 12-24 are illustrative flow charts of steps involved in providing remote access to functions of a local interactive television program guide in accordance with the principles of the present invention. The steps shown in FIGS. 12-24 are illustrative and may be performed in any suitable order. Moreover, in practice it may be desirable to combine or delete various steps or combinations of steps shown in the flow charts.

FIG. 12 shows illustrative steps involved in providing remote access to the various program guide functions. At step 1200, a remote access link is established between the remote access program guide implemented on remote program guide access device 24 and the interactive television program guide implemented on interactive television program guide equipment 17 using remote access link 19. At step 1210, the remote access program guide provides the user with the opportunity to remotely access functions of the interactive program guide over the remote access link.

The remote access program guide may, for example, obtain a user command from the user that indicates a desired program guide function using remote program guide access device 24 (substep 1265) and then remotely provide the indicated program guide function to the user. A user may indicate a desired function by entering an appropriate command using user interface 52. The user may, for example, enter a command using a keyboard, speak a command into a microphone, select an on-screen button using a pointing device, or any other suitable approach.

The indicated program guide function may be remotely provided to the user audibly (substep 1270) using, for example, a speaker, car stereo, or other device capable of producing sounds that suitably  
5 indicate to the user program guide information. Alternatively, the indicated program guide function may be remotely provided to the user visually (at substep 1280), for example, by using a monitor, LCD, or other display device.

10 Establishing the remote access link between the remote access program guide and the local interactive television program guide implemented on interactive television program guide equipment 17 as indicated by step 1200 and providing the user with an  
15 opportunity to remotely access functions of the local interactive television program guide over remote access link 19 (step 1210) may depend on the configuration of the interactive television program guide system. FIGS. 13a-13e show illustrative variations of steps  
20 1200 and 1210 of FIG. 12 for establishing remote access link 19 and for providing the user with remote access to program guide functions for the illustrative systems 10 of FIGS. 2a-2d and FIGS. 6a-6c.

FIG. 13a illustrates steps involved in  
25 establishing remote access link 19 and for providing the user with remote access to program guide functions in the systems of FIGS. 2a and 2c. In these systems, remote access link 19 may be established between the remote access program guide and the interactive  
30 television program guide via a communications device in user television equipment 22 (Step 1200a). The local interactive television program guide may be wholly implemented on user television 22 as in system 10 of

FIG. 2a, or may be partially implemented on user television equipment 22 as, for example, an interactive program guide client, as in system 10 of FIG. 2c. At step 1210a, remote program guide access device 24 may  
5 provide the user with the opportunity to remotely access the functions of the local interactive television program guide over the remote access link with a communications device.

Remote access link 19 may be established  
10 between the remote access program guide and the interactive television program guide via remote program guide access device 24 and a communications device in television distribution facility 16 or other location for a system configured as shown in FIG. 2d. Providing  
15 remote access to the functions of the local interactive television program guide in such a system may, for example, involve the steps shown in FIG. 13b. At step 1200b, for example, remote access link 19 may be established with a communications device in television  
20 distribution facility 16. The remote access program guide may, for example, provide the user with the opportunity to remotely access functions of the program guide with a communications device in the television distribution facility 16 at step 1210b.

25 If television distribution facility 16 includes a program guide server as shown in FIG. 2c, remote access link 19 may be established between the remote access program guide and the interactive television program guide via remote program guide  
30 access device 24 and a communications device in television distribution facility 16 as indicated by step 1200c of FIG. 13c. At step 1210c remote program guide access device 24 may, for example, provide the



user with the opportunity to remotely access the functions of the program guide over remote access link 19 with a communications device in distribution facility 16.

5 Steps involved in establishing remote access link 19 in on-line program guide systems that communicate with the remote access program guide such as in systems 10 of FIGS. 6a and 6b are shown in FIGS. 13d and 13e. In the on-line program guide system of  
10 FIG. 6a, for example, remote access link 19 may be established between the local interactive television program guide and the remote access program guide with Internet service system 61 (step 1200d, FIG. 13d). In the client-server on-line program guide system of FIG.  
15 6b, for example, remote access link 19 may be established between the local interactive television program guide and the remote access program guide with an Internet service system in contact with program guide server 25 (step 1200e, FIG. 13e). The remote  
20 access program guide may provide the user with the opportunity to remotely access the functions of the program guide at steps 1210d and 1210e of FIGS. 13d and 13e, respectively.

Establishing remote access link 19 at  
25 step 1200 of FIG. 12 may also involve exchanging one or more access communications between the interactive television program guide implemented on interactive television program guide equipment 17 and the remote access program guide implemented on remote program  
30 guide access device 24, as indicated by substep 1202 of FIG. 14. Access communicators may include any client-server or peer-to-peer communication construct suitable for providing program guide information across remote

access link 19. Access communications may include, for example, requests, commands, messages, or remote procedure calls, as indicated by substeps 1204, 1205, 1206, and 1207, respectively.

5           Access communications may also involve complex communications between application constructs running on remote program guide access device 24 and interactive television program guide equipment 17. Access communications may, for example, be object  
10 based, as indicated by substep 1208. Objects running in two program guides, for example, may communicate using an Object Request Broker (ORB). The program guide information may, for example, be encapsulated as component object model (COM) objects and persisted to  
15 files that are transmitted over remote access link 19. Access communications may also include, for example, HTML formatted markup language documents (e.g., Web pages), that are exchanged between remote program guide access device 24 and interactive television program  
20 guide equipment 17 via Internet service system 61, as indicated by substep 1209.

FIGS. 15-23 are flowcharts of illustrative steps involved in providing remote access to a number of specific program guide functions. Remote access to  
25 the functions may be provided in any interactive television program guide system, such as a system 10 having the arrangements of interactive television program guide equipment 17 shown in FIGS. 2a-2d and FIGS. 6a and 6b. The steps shown in FIGS. 12-14 are  
30 not shown in the flowcharts of FIGS. 15-23 to avoid over-complicating the drawings, although any suitable combination or combinations of the steps of the flowcharts of FIGS. 12-23 may be used in practice.

FIG. 15 shows illustrative steps involved in remotely providing program listings information to a user. At step 1600, program listings information is remotely obtained from the local interactive television program guide implemented on interactive television program guide equipment 17 via remote access link 19. The remote access program guide may, for example, obtain this information on startup, periodically, continuously, on demand in response to a suitable user command, or using any other suitable scheme using remote program guide access device 24.

At step 1610, the program listings information may be provided to the user. The program listings information may be displayed for the user by the remote access program guide in a table, listing grid, or other suitable construct, using user interface 52 (substep 1620). Alternatively, program listings information may be provided audibly for the user by using, for example, a speaker (substep 1630).

At step 1640, the remote access program guide may provide the user with the opportunity to select a program listing. In response to such a selection, the remote access program guide may provide the user with the opportunity to access other remote program guide features for the listing (e.g., displays additional info, schedule a program reminder, record, parental control, order the program if it is a pay-per-view program, etc.).

FIG. 16 shows illustrative steps involved in providing the user with remote access to the program reminder feature of a local interactive television program guide. At step 1700, a user is provided with an opportunity to schedule a programming reminder. The

user may be provided with an opportunity to remotely schedule a programming reminder with the local guide or with the remote access guide. This opportunity, may, for example, be provided in response to the user  
5 selection of a program listing. At step 1710, the program reminder is scheduled by the local guide or the remote access guide. The program reminder may be scheduled with the local interactive television program guide (substep 1720), may be stored by the remote  
10 access interactive television program guide (substep 1730), or both.

At step 1740, the program reminder is generated at an appropriate time (e.g., a predefined or user-selectable number of minutes, hours, or days)  
15 before a program is scheduled to air. The reminder may be generated by the local interactive television program guide implemented on interactive television program guide equipment 17, or may be generated by the remote interactive television program guide. The  
20 program reminder may, for example, be sent to the user via e-mail or alphanumeric page, as indicated by substeps 1750 and 1760 respectively.

FIG. 17 shows illustrative steps involved in providing a user with remote access to the parental  
25 control features of the local interactive television program guide implemented on interactive television program guide equipment 17. At step 1800, parental control information is remotely obtained. This may occur, for example, on startup, periodically,  
30 continuously, on demand in response to a suitable user command, or using any other suitable scheme.

The remote access program guide may provide the user with the opportunity to parentally control

programming (e.g., by program, channel, theme, time, etc.) in any suitable manner (step 1810). At step 1820, the remote access program guide remotely sets a parental control setting with the interactive television program guide via remote access link 19. Remote program guide access device 24 may use, for example, one or more access communications sent over remote access link 19 to exchange the parental control settings with interactive television program guide 17.

Programming may be locked locally by a user via user television equipment 22, or may have been locked remotely by the remote access program guide. The remote access program guide may indicate to a user that programming is locked (e.g., by program, channel, theme, etc.) with remote program guide access device 24 at step 1830. Remote program guide access device 24 may use, for example, a notice, icon, synthesized voice output, message, or any other suitable indicator.

FIG. 18 shows illustrative steps involved in providing a user with remote access to the favorites and user profile functions of the interactive television program guide implemented on interactive television program guide equipment 17. At step 1900, user preference profiles are remotely obtained from the local interactive television program guide by the remote access interactive television program guide via remote access link 19. The information or profiles may be obtained, for example, on startup, periodically, continuously, on demand in response to a suitable user command, or using any other suitable scheme.

The remote access program guide may provide the user with the opportunity remotely adjust user profiles (step 1910). The user may, for example, add

or delete favorite channels, themes, indicate likes or dislikes, etc. At step 1920, the remote access program guide remotely adjusts user profiles with the local interactive television program guide. This may be  
5 accomplished by, for example, remote program access device 24 exchanging one or more access communications with interactive television guide equipment 17 via remote access link 19. The one or more access communications may indicate one or more user profiles  
10 or favorites information. At step 1925, the remote program guide obtains program guide data according to the preference profiles.

At step 1930, remote program guide access device 24 may provide the user with the opportunity to  
15 remotely navigate through favorites. Remote program guide access device 24 may, for example, have obtained program listings information (step 1600, FIG. 15), sorted the information according to the favorites information, and displayed only listings for a favorite  
20 channel or theme. Alternatively, remote program guide access device 24 may, for example, display television program listings in a grid, table, or list while highlighting favorite channels. A user may be provided with the opportunity to "jump" between favorite  
25 listings or channels by issuing an appropriate command using user interface 52.

FIG. 19 shows illustrative steps involved in providing a user with remote access to program recording. At step 2000, the remote access program  
30 guide provides the user with the opportunity to select a program for recording. This opportunity may be provided in response to the user indicating a desire to record programming by, for example, selecting a program

listing (step 1640, FIG. 15) and issuing a suitable  
command. In response, the remote access program guide  
remotely schedules the program for recording with the  
local interactive television program guide implemented  
5 on interactive television program guide equipment 17  
(step 2000). Remote program guide access device 24 may  
exchange, for example, one or more access  
communications with interactive television program  
guide equipment 17 that are sent over remote access  
10 link 19.

At an appropriate time, the program is  
recorded (step 2020). As indicated by substeps 2030  
and 2040, the program may be recorded by the local  
interactive program guide on interactive television  
15 program guide equipment 17 (e.g., digital storage  
device 31 or secondary storage device 32 of user  
television equipment 22 (FIG. 3), or on program guide  
server 25, or may be recorded by remote program guide  
access device 24 on storage 56 (FIG. 5) or program  
20 guide server 25. If the program is recorded by remote  
program guide access device 24, the programming may,  
for example, be digitized and transmitted as a MPEG-2  
data stream over remote access link 19 using access  
communications.

25 FIG. 20 shows illustrative steps involved in  
providing the user with remote access to remotely order  
pay-per-view programs and packages using the local  
interactive television program guide implemented on  
interactive television program guide equipment 17. At  
30 step 2100, the remote access program guide obtains pay-  
per-view information (e.g., price, ordering  
information, time, event code, selections in a package,  
etc.), from the interactive program guide implemented

on interactive television program guide equipment 17 via remote access link 19. The pay-per-view information may be obtained on startup, periodically, continuously, on demand in response to a suitable user command, or using any other suitable scheme. The pay-per-view information is provided to the user by the remote access program guide using user interface 52 of remote program guide access device 24 in any suitable fashion (step 2110).

At step 2120, the remote access program guide provides the user with the opportunity to remotely order a pay-per-view program or package. This opportunity may be provided, for example, in response to the user selecting a pay-per-view program listing or package listing (e.g., step 1640, FIG. 15). At step 2130, the remote access program guide remotely orders the pay-per-view program or package by indicating the program or package to the local interactive television program guide by, for example, exchanging one or more access communications over remote access link 19 (step 2133). The access communications may contain the pay-per-view information for the selected pay-per-view program or package. The local guide may order the program or package at step 2135. Alternately, the remote access program guide may order the pay-per-view program (step 2137).

The way in which the remote access program guide orders the pay-per-view program using the local interactive television program guide may depend on the configuration of the system. If the system is configured as shown in FIGS. 2a and 2c, the remote access program guide may, for example, provide the pay-per-view information to the interactive television



program guide implemented at least partially on user television equipment 22. The interactive television program guide may, in turn, order the pay-per-view program with television distribution facility 16. If  
5 the system is configured as shown in FIGS. 2b and 2d, the remote access program guide may, for example, provide the pay-per-view information to the interactive television program guide via separate communications device 27. If the system is configured as shown in  
10 FIGS. 6a and 6b, the remote access program guide may provide the pay-per-view information via Internet service system 61.

FIG. 21 shows illustrative steps involved in providing a user with access to remotely-played video  
15 or audio. At step 2200, the remote access program guide may obtain video or audio information from the interactive television program guide implemented on interactive television program guide equipment 17 via remote access link 19. This may occur, for example, in  
20 response to the user selecting a video or audio listing displayed by remote program guide access device 24.

Substeps 2210 and 2220 show illustrative steps involved in obtaining directory information used in providing a user with audio and video information.  
25 The remote access program guide may query the local interactive television program guide implemented on interactive television program guide equipment 17 for directory information using one or more access communications that are sent over remote access link 19  
30 (step 2210). The directory information may be contained, for example, in a media library directory for a media library that is stored on user television equipment 22, or by television distribution facility

16. The directory information may be provided back to the remote access program guide by exchanging one or more remote access communications between interactive television program guide equipment 17 and remote  
5 program guide access device 24 over remote access link 19, as is indicated by substep 2220. Step 2210 may be skipped and step 2220 performed when, for example, directory information or listings are provided to the remote access guide ahead of time.

10 At step 2230, the remote access program guide may provide the user with the opportunity to select a video or audio for remote playing. The user may select a video or audio by, for example, selecting a listing that is indicated to the user by user interface 52.

15 The user may be provided with an opportunity to play a program in real-time via the local and remote guides, or to play a stored program. In response, the remote access program guide may obtain the selected video or audio from the local interactive television program  
20 guide using access communications that are sent over remote access link 19. The access communications may contain the video or audio in a suitable analog or digital format. At step 2250, remote program guide access device 24 remotely plays the video or audio for  
25 the user using user interface 52. Selected video may be displayed, for example, on a suitable monitor, LCD, or other suitable display device. Selected audio may be played for the user using any suitable speaker. Audio may, for example, be played by a car stereo if  
30 remote program guide access device 24 is an automobile PC.

FIG. 22 shows illustrative steps involved in providing the user with the opportunity to remotely

poll the local interactive television program guide implemented on interactive television program guide equipment 17. At step 2300, the remote access program guide may poll the interactive television program guide  
5 for polling information. The polling information may indicate, for example, whether user television equipment 22 is in use, the current channel user television equipment 22 is tuned to, the current programming rating, current program title, the status  
10 of remote access link 19 or communications paths 20, the available devices of user television equipment 22, or any other status related information.

Step 2300 may include substeps 2310 and 2320 for obtaining the polling information. At substep  
15 2310, remote program guide access device 24 may obtain the polling information. Polling information may be obtained on startup, periodically, continuously, on demand in response to a suitable user command, or using any other suitable scheme. More particularly, status  
20 information may be obtained using SNMP (substep 2320), if desired. If SNMP is used to obtain polling information, for example, the access communications may include commands and protocol data units (PDUs). Other suitable network management protocols may also be used.  
25 At step 2330, remote program guide access device 24 may present the polling information to the user in any suitable method. The polling information may be displayed, for example, in a status display screen such as status display screen 200 of FIG. 11. Polling  
30 information may, for example, be output to the user via synthesized voice outputs that are played using a speaker and voice synthesis hardware and software.

FIG. 23 shows illustrative steps involved in providing the user with the opportunity to create messages and send them between the local interactive television program guide implemented on interactive television program guide equipment 17 and the remote access program guide. At step 2400, the user is provided with the opportunity to create a message. The user may create the message with the local interactive television program guide using, for example, user interface 46 of user television equipment 22 (FIG. 4), or the user may create the message using user interface 52 of remote program guide access device 24.

The message may include any suitable text, graphics, or audio. The user may, for example, speak an audio message into a microphone. The audio message may be digitized and stored in an access communication for transfer over remote access link 19. Alternatively, the user may input a text message using a suitable text input device (e.g., a keyboard). However the message is created and whatever its content, the message is transferred over remote access link 19 using one or more access communications. The message may be transferred from the interactive television program guide to the remote access program guide, or from the remote access program guide to the local interactive television program guide, depending on where the message was created and its intended destination. At step 2410, the message may be presented to the user by user television equipment 22 (e.g., substep 2430), or by remote program guide access device 24 (e.g., substep 2440).

The discussion thus far has focused on implementing the invention with an interactive

television program guide. The invention may also be applied to non-program-guide interactive television applications. Local non-program-guide applications run on user television equipment such as a set-top box and  
5 corresponding remote access non-program-guide application may run on a remote access device. Interactive television applications may be stand-alone applications, portions of an operating system, or any suitable combination thereof.

10 One non-program-guide application that may be implemented on a set-top box in accordance with the present invention is an Internet browser. An Internet browser may have settings such as bookmarks, parental control settings, and general preferences that control  
15 how the browser functions. As shown in FIG. 24, a remote access device may provide the user with access to a browser application by displaying, for example, browser screen 700 of a remote access browser application. Browser screen 799 may have a bookmark  
20 option 705. A user may, for example, select bookmark option 705 and add a bookmark (i.e., a record of the address of the current web site that can be used to access the site). After the user adds a bookmark with a remote access Internet browser, the remote access  
25 Internet browser may exchange one or more access communications with a local Internet browser to add the bookmark to the local browser.

Another application that may be implemented or a set-top box in accordance with the present  
30 invention is a shopping application. A shopping application may have settings such as a default shipping address and credit card number. As shown in FIG. 25, a remote access shopping application screen

730 may have settings such as a shipping address 720, and credit card number 725. A user may, for example, add a shipping address and credit card information. After a user adds shipping and credit card information  
5 with the remote access shopping application, the remote access application may exchange one or more access communications with a local shopping application to provide the information to the local application.

Another non-program-guide application that  
10 may be implemented on a set-top box and accessed via a remote access device in accordance with the present invention is a stock ticker. A stock ticker may have settings such as settings indicating the top ten stocks in which the user is interested. As shown in FIG. 26,  
15 a remote access device may display a remote access stock ticker settings screen 710. Stock ticker settings screen 710 may have, for example, ticker symbol 712 and a top ten stocks option 715. A user may, for example, add a top stock. By exchanging one  
20 or more access communications, the remote access stock ticker application can make the top ten stock settings effective on a local stock ticker application.

A chat application may be implemented on a set top box. Chat applications are services that allow  
25 users to exchange chat messages with other users in real time. A chat application may be implemented as a stand-alone chat application or as part of another application such as a program guide application. Chat applications that may be implemented on user television  
30 equipment are described in DeWeese et al. U.S. patent application Serial No. \_\_\_\_\_, filed concurrently herewith (Attorney Docket No. UV-101), which is hereby incorporated by reference herein in its entirety. A

user may remotely adjust settings associated with a chat application such as the size of a chat window, an address book, or whether to filter potentially offensive messages. After the user adjusts chat  
5 settings with a remote access chat application running on a remote access device, the remote access chat application may remotely adjust the settings of a local chat application by, for example, exchanging one or more access communications with the local chat  
10 application over a remote access link.

If desired, the settings of an e-mail application running on a set-top box may be adjusted remotely. Set-top based messaging systems are described, for example, in concurrently filed McKissick  
15 et al. U.S. patent application Serial No. \_\_\_\_\_ (Attorney Docket No. UV-128), which is hereby incorporated by reference herein in its entirety. Users may, for example, remotely add to or change an address book. When the user adjusts e-mail settings  
20 with a remote access e-mail application running on a remote access device, the remote access e-mail application may remotely adjust the settings of a local e-mail application by, for example, exchanging one ore more access communications with the local e-mail  
25 application over a remote access link.

The foregoing is merely illustrative of the principles of this invention and various modifications can be made by those skilled in the art without departing from the scope and spirit of the invention.

099T20 THESEED